Desalination and Water Treatment
www.deswater.com

46 (2012) 215–226
August

doi: 10.1080/19443994.2012.677554

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Simultaneous decolorization of binary mixture of blue disperse and yellow basic dyes by electrocoagulation

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Received 25 September 2011; Accepted 5 March 2012

ABSTRACT

In this paper, electrocoagulation (EC) has been used for the removal of color from solution containing a disperse dye (Disperse blue 56) and a basic dye (Basic Yellow 28) in the same solution. Iron electrodes were arranged in a monopolar fashion. In the EC of the dye mixture, the effects of the supporting electrolyte, initial pH, electrolysis time, and current density were examined. The results indicated that the majority of the aforementioned dyes in the synthetic wastewater were effectively removed when iron electrodes were used as a sacrificial anode. The amount of dye removed was found by the application of the first derivative spectrophotometric method to the synthetic dye mixtures. In the presence of both dye molecules, the optimum pH was found to be 7, optimum NaCl concentration was 3,000 mg L^{-1}, and optimum current density was 10.89 mA cm^{-2}. The experimental data were fit to a variety of isotherm models to determine the characteristics of the EC process. The results indicated that the model provided the best fit for the removal of dye mixture.

Keywords: Disperse blue 56; Basic yellow 28; Electrocoagulation; Derivative spectrophotometry

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